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IS 5161 (1969): Flexible electric heating pads for domestic use [ETD 32: Electrical Appliances]



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IS : 5161 - 1969

( Reaffirmed 2001 )

*Indian Standard*

**SPECIFICATION FOR  
FLEXIBLE ELECTRIC HEATING PADS FOR  
DOMESTIC USE**

( Second Reprint SEPTEMBER 1986 )

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**INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 RAHADUR SHAH ZAFAR MARG,  
NEW DELHI 110002**

# Indian Standard

## SPECIFICATION FOR FLEXIBLE ELECTRIC HEATING PADS FOR DOMESTIC USE

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*Indian Standard*  
**SPECIFICATION FOR  
FLEXIBLE ELECTRIC HEATING PADS FOR  
DOMESTIC USE**

**0. FOREWORD**

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 16 June 1969, after the draft finalized by the Electrical Appliances Sectional Committee had been approved by the Electrotechnical Division Council.

**0.2** This specification covers the electrical characteristics of flexible electric heating pad. The general, safety and performance requirements specified in this standard ensure personal safety against electric shock, safety against the effects of excessive temperature and fire, and reliable operation.

**0.3** While preparing this standard, assistance has been derived from the following

SAA C 149-1954 Flexible electric heating pads. Standards Association of Australia.

BS 1789 1951 Electric heating pads. British Standards Institution.

SABS 184-1960 Electric heating pads and blankets. South African Bureau of Standards

**0.4** 'Indian Standard general and safety requirements for light electrical appliances (*third revision*)' (IS 302-1967), references to which have been made, is a necessary adjunct to this standard. Should, however, any deviation exist between the requirements of IS 302-1967 and those of this standard, the provisions of the latter shall apply.

**0.5** This standard is one of a series of standards on domestic electrical appliances

**0.6** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard

\*Rules for rounding off numerical values (*revised*)

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**1. SCOPE**

**1.1** This standard covers the requirements and methods of tests for domestic type flexible electric heating pads intended for use on the human body and designed for operation on voltages not exceeding 250 V ac single phase 50 c/s or dc

**1.2** This standard does not cover heating pads for use in hospitals

**2. TERMINOLOGY**

**2.0** For the purpose of this standard, the following definitions shall apply in addition to those specified in IS 302 1967\*

**2.1 Heating Pad** — A flexible electric heating appliance designed for local application of heat on the human body and having an area (measured on one side only) not exceeding 2 500 cm<sup>2</sup>

**2.2 Foundation** — The material to which the heating element (s) is (are) attached or by means of which the heating unit is located

**2.3 Section of Heating Element** — Part of a heating element which may be switched 'on' or 'off' independently

**2.4 Enclosure** — The permanent covering which encloses the heating unit, the thermostats and cut-outs, if any

**2.5 Outer Cover** — A cover for the heating pad intended to be readily removable by the user

**2.6 Surface Heating Area** — The projected surface area of the heating unit on any one side of the heating pad when laid unstrained on a flat surface without folds

**3. RATING**

**3.1 Voltage Rating** — The provisions of 3.1 of IS 302-1967\* shall apply

**3.2 Rated Input** — The rated input of heating pads shall not exceed 0.07 W/cm<sup>2</sup> of the surface heating area where such area exceeds 500 cm<sup>2</sup>, and shall not exceed 0.1 W/cm<sup>2</sup> of the surface heating area where such area does not exceed 500 cm<sup>2</sup>

**4. MATERIALS**

**4.1** The provisions of 5 of IS 302-1967\* shall apply

**5. CONSTRUCTION**

**5.1** The provisions specified in 5.1.1 to 5.1.3 shall apply in addition to the relevant provisions of 7 of IS 302 1967\*

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\*General and safety requirements for light electrical appliances (third revision)



**5.1.1** Use of screws, bolts, sharp points and edges on components which may cause damage to the enclosure in use, shall be avoided.

**5.1.2** Rigid or hard components such as enclosures of thermostats and cut-outs shall be adequately padded so as to avoid discomfort to the user or damage to the enclosure or outer cover

**5.1.3** The conductors shall be run, connected, soldered and taped in such a manner that no electrical or fire hazard shall occur under normal service condition. The attachment of the accessories shall be secured

## **6. HEATING ELEMENT**

**6.1** The heating element may be one of the following types

- a) Heating wire or tape attached to a foundation, straight or after coiling on a core material, and
- b) Heating wire inter-woven with an insulating yarn, one forming the warp and the other the weft of the resultant fabric

**6.2** The heating element when used without coiling on a core shall have a continuous insulating cover or coating which is not damaged or displaced during the fabrication work

**6.3** When the heating element is coiled on a core material, the winding shall be uniform in pitch throughout the length of the element, and shall have a permanent insulating cover or coating either on the conductor or on the complete element including core

**6.4** The electrical resistance of a 5-cm length of the element in any part of it shall be uniform within plus or minus 5 percent.

**6.5** The heating element/s) shall be so constructed and fixed in the enclosure that no section of it shall cross another section, that there is no risk of short circuits or local overheating

**6.6** The design and location of the heating elements shall ensure that the temperature rise at any point shall not exceed the average temperature rise of the heating pad by more than 5 deg

**6.7** The heating unit with the foundation, if any, shall be securely attached within the enclosure so that it cannot be displaced, folded or crumpled with respect to the enclosure

## **7. ENCLOSURE AND COVERS**

**7.1** The enclosure of the heating pad shall be of strong and durable material, and shall be moisture-resistant. The heating pad may also be waterproof if declared by the manufacturer in which case it shall be tested in accordance with 12.12

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**7.2** The enclosure shall be of non-flammable or slow-burning material or shall be separated from the element by an intermediate cover of such material.

**7.3** The enclosure shall completely enclose cut-outs, the heating unit, thermostats, and any other live components within the heating pad. When the enclosure is declared waterproof it shall effectively seal-in the components within it at all points including the supply flexible cord entry.

**7.4** The enclosure shall be strongly stitched or secured so that the seams and joints are not strained unduly in service.

**7.5** All cover materials, whether forming an integral part of the enclosure or an outer cover, shall be non-irritant to the human skin and shall contain no impregnating or finishing matter having a deleterious effect upon the human body.

**NOTE** — Non-irritant material shall not refer to materials to which individual persons may be allergic

**7.6** Outer covers shall be readily detachable by the user and shall be washable. The opening in the outer cover for admission of the heating pad shall be secured by an overlapping flap held closed by hooks, buttons, or other closures designed to avoid discomfort to the user.

## **8. WIRING AND CONNECTIONS**

**8.1 Internal Wiring** — All wires and their immediate insulation shall be non-oxidizing and capable of resisting the maximum temperatures occurring in service. Joints shall be durably made. The joints between the internal conductors and those in the supply flexible cord shall be secured and reinforced so as to avoid damage or displacement by any pull on the flexible cord likely to be transmitted to the joints. If solder is used in any internal joints it shall have a melting temperature of at least 200°C. Any internal crossing of lead wires or interconnecting wires of elements shall be well insulated between the crossing wires and shall be anchored on the foundation to avoid relative movement.

### **8.2 External Connections**

**8.2.1** The heating pad shall be provided with a flexible cord not less than 3 m in length measured outside the outer cover of the pad. The flexible cord may have provision of an earthing core only if there are exposed conducting parts on the transformer or other regulating device supplied with the heating pad and the relevant provisions of IS 302-1967\* shall apply.

**8.2.2** The supply flexible cord shall be made moisture-resistant or waterproof for a length of at least 30 cm adjacent to the heating pad, as appropriate to the pad.

\*General and safety requirements for light electrical appliances (third revision).

8.2.3 Subject to the above requirements the supply flexible cord shall comply with 20 of IS 302-1967\*.

## 9. SWITCHES AND CONTROLS

### 9.1 Cord Switch

9.1.1 Every heating pad shall have a double pole switch for switching off the supply. This switch may have several operative positions to regulate the heat. All such operative positions shall be identifiable by tactile indicators for use in the dark.

9.1.2 The cord switch shall be fitted on the supply flexible cord at a distance between 25 cm and 50 cm from the cord entry of the heating pad.

9.1.3 The cord switch shall be designed for ease in holding while making a temperature selection.

9.1.4 The cord switch shall comply with IS 3854-1966†.

### 9.2 Thermostats and Cut-Outs

9.2.1 Each heating pad shall be provided with thermostats or thermal cut-outs. At least one thermostat or thermal cut-out shall be provided for every 625 cm<sup>2</sup> of surface heating or part thereof. Every section of the heating element shall however have at least two thermostats or thermal cut-outs in series under any operating conditions.

9.2.2 The location of the thermostats or cut-outs shall be designed to give adequate protection to all parts of the heating pad and shall be evenly distributed over the surface heating area.

9.2.3 The thermostats or cut-outs shall be encased in rigid non-ignitable material and constructed to be dustproof and not capable of being easily tampered with by the user.

9.2.4 The thermostats or cut-outs shall have adequate current carrying and rupturing capacity and shall pass the tests specified in 12.13.2.

9.3 Transformers—In addition to the specific requirements given under 9.3.1 any transformers supplied with the heating pads shall be of a suitable quality. Extra low voltage transformers, if used, shall comply with IS 1416-1959‡.

9.3.1 The output connection from the extra low voltage transformers, if used, to the heating pads shall not be through any plug and socket, or appliance connectors of conventional type used on low voltage mains.

\*General and safety requirements for light electrical appliances (third revision)

†Specification for switches for domestic and similar purposes

‡Specification for extra low voltage transformers

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## 10. SAFETY AND PERFORMANCE REQUIREMENTS

**10.1 Dielectric Strength** — When tested in accordance with 12.6, the heating pad shall not show any puncture or deterioration of its insulation.

**10.2 Electrical Insulation** — When tested in accordance with 12.7, the insulation resistance of the heating pad shall not be less than 1 megohms for extra low voltage construction and not less than 10 megohms for any other construction other than extra low voltage construction.

**10.3 Input** — When measured in accordance with 12.8 the input shall not differ from the marked input of the heating pad by more than 10 percent.

**10.4 Surface Temperature** — When tested in accordance with 12.9, the surface temperature measured at any point on the heating pad shall not exceed 90°C for the pad in flat position and 100°C for the pad folded.

**10.5 Usage Simulation** — The heating pad shall comply with the test specified in 12.10 performing properly before and after the test.

**10.6 Endurance** — The heating pad shall pass the endurance test specified in 12.13.

**10.7 Slow Burning Property** — The materials such as the foundation or enclosure which may be in direct contact with the heating element shall pass the test for slow burning property specified in 12.14.

## 11. MARKING AND INSTRUCTION FOR USE

**11.1** The heating pad shall have the following information and notices marked indelibly on the enclosure or cover immediately inside the outer cover as well as on the outer cover:

- a) Name or registered trade-mark of the manufacturer;
- b) Type or model number and serial number of the heating pad,
- c) Rated voltage or voltage ranges in volts;
- d) If limited by the nature of any component to use on alternating current the words 'AC ONLY';
- e) The words 'DO NOT USE THE PAD FOLDED';
- f) If designed for operation through a transformer, details of the transformer and the words 'DO NOT CONNECT DIRECT ON MAINS';
- g) The rated input in watts,
- h) The cut-off temperature settings of thermostats (at maximum setting) or thermal cut-outs;
- j) Warning against the use of pins,

- k) Warning against wetting of pad or against damaging the waterproof cover as appropriate;
- m) The word 'WATERPROOF', if applicable;
- n) The words 'READ INSTRUCTIONS CAREFULLY'; and
- p) Country of origin.

**11.1.1** The heating pads may also be marked with the ISI Certification Mark.

**NOTE**—The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on the products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of the conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

**11.2** The heating pad shall be supplied with full printed instructions and precautions including the following:

- a) Do not use the pad if wet (applicable to non-waterproof pads);
- b) Do not sleep on the pad when switched on (applicable to non-waterproof pads);
- c) Do not leave pad unattended if it is being used for a baby or helpless person;
- d) Remove detachable cover and inspect pad for pin-holes, abrasions and damage to the waterproof covering or coat;
- e) Do not leave the pad connected to an electric supply circuit when not in actual use; and
- f) Do not pull the pad by the supply cord or use the cord as a handle.

## **12. TESTS**

**12.1 Categories of Tests**—The tests specified in Table 1 shall constitute type tests, and those in Table 2, the acceptance tests and the routine tests.

**12.1.1 Criteria of Approval**—All samples shall successfully pass all the type tests for proving conformity with the requirements of this standard. If any of the samples should fail in any of the type tests, testing authority, at its discretion, may call for fresh samples not exceeding twice the original number and subject them again to all tests or test(s) in which failure(s) occurred. No single failure shall be permitted in the repeat test(s).

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**12.1.2 Sampling Procedure for Acceptance Test**—Sampling procedure shall be as specified in Appendix B of IS:302-1967\*.

**TABLE 1 TYPE TESTS**

( Clause 12.1 )

SL No	TESTS	CLAUSE REFERENCE
1	Visual examination	12.4
2	Strain relief	12.5
3	Dielectric strength	12.6
4	Insulation resistance	12.7
5	Input	12.8
6	Surface temperature	12.9
7	Usage simulation test	12.10
8	Moisture resistance	12.11
9	Waterproofness ( applicable to waterproof pads only )	12.12
10	Endurance	12.13
11	Slow burning	12.14

**TABLE 2 ACCEPTANCE TESTS AND ROUTINE TESTS**

( Clause 12.1 )

SL No.	TESTS	CLAUSE REFERENCE
1	Visual examination	12.4
2	Strain relief	12.5
3	Dielectric strength	12.6
4	Insulation resistance	12.7
5	Input	12.8
6	Surface temperature	12.9
7	Moisture resistance	12.11
8	Waterproofness ( applicable to waterproof pads only )	12.12

**12.2 General Conditions of Tests**—Unless specified otherwise in the relevant clause, the conditions specified in 26 of IS:302-1967\* shall apply.

**12.3 Sequence**—The tests shall be carried out in the sequence in which they appear herein.

**12.4 Visual Examination**—The heating pad shall be visually examined and inspected for conformity with the relevant requirements of 4, 5, 7.3, 7.6, 8.2.1, 9.1.2, 9.3.1 and 11.

\*General and safety requirements for light electrical appliances ( third revision )

**12.5 Strain Relief**—The heating pad shall be clamped along one of the edges adjacent to the corner opposite to the flexible cord entry by means of a suitable clamp, and a pull of 150 N shall be gradually applied on the cord, and maintained for one minute. The pad shall then be clamped along the other edge adjacent to the corner opposite to the flexible cord entry and the pull repeated as described above. The flexible cord entry shall show, no signs of mechanical failure or damage to the seal.

**12.6 Dielectric Strength**—The outer cover shall be removed and the heating pad shall be laid flat on a surface between two metal foils, each metal foil being at least the size of the heating pad. The heating pad shall be placed with metal foils on either side between two mats of woollen felt, each 25 mm thick and extending beyond the edges of the heating pad for at least 50 mm. A uniform loading of 10 g/cm<sup>2</sup> shall be applied and the metal foils shall connected together. The dielectric strength test is carried out according to 41.1 of IS:302-1967\* applying the voltage between the metal foil and the terminations of the supply flexible cord.

**12.7 Insulation Resistance**—Immediately following the dielectric strength test the insulation resistance between the metal foil and the heating element(s) shall be measured as specified in 41.1 of IS:302-1967\*.

**12.8 Input**—The metal foil is removed and the heating pad is replaced between the felt mats in its original position. The heating pad is connected to the rated supply voltage and operated under conditions of maximum input for 15 minutes. At the end of this period input shall be measured as specified in 43.1 of IS:302-1967\*.

## 12.9 Surface Temperature

**12.9.1** The heating pad is operated as specified in 12.8 continuously for 4 hours at 110 percent of the maximum rated voltage with the heat regulating switch or other device set in the full heat position. Throughout this period the temperature of the outer surface of the pad shall be measured with thermocouples having iron-constantan wires not larger than 0.3 mm dia or bead type thermistors with time constant of 2 seconds or less, attached to square copper plates measuring approximately 50 × 50 × 0.5 mm placed below the pad on the felt mat in contact with the enclosure of the pad. The number of measuring elements shall be such as to cover at least 15 percent of the surface area of one side of the heating pad; and they shall be distributed evenly.

**12.9.2** The heating test is repeated with the pad folded symmetrically along its shorter axis, using half the number of measuring elements distributed evenly within the fold of the pad.

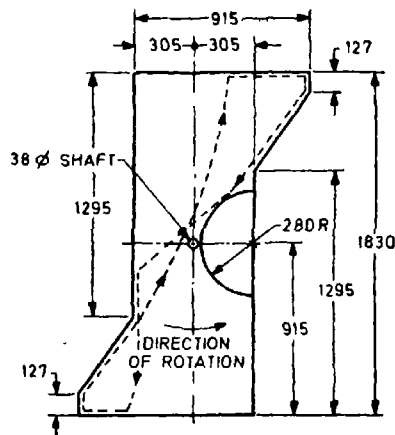
\*General and safety requirements for light electrical appliances (third revision).

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**12.9.3** If a thermal cut-out is found to have operated during the test described in 12.9.1 it shall be reset before commencing the test in 12.9.2. At the end of this test also any thermal cut-out which has operated may be reset.

**12.9.4** When carried out as a routine test the measurement of the temperature may be made just after the first cut off of the thermostat or thermal cut-out.

**12.10 Usage Simulation Test** — The heating pad complete with supply flexible cord up to but not including, switch or control unit, shall be placed in a tumbling machine as shown in Fig. 1, and be rotated for 5000 revolutions at a speed of 6 to 7 rev/min. No mechanical or electrical damage shall result from the test nor shall there be any sign of undue wear or abrasion.



All dimensions in millimetres.

**NOTE 1** — Dotted line indicates approximate path taken by pad as machine rotates

**NOTE 2** — The box which is 610 mm wide is made on a strong frame of timber and lined, to the dimensions shown, with suitable material so as to be practically non-resilient at impact faces.

**FIG. 1 TUMBLING MACHINE**



**12.11 Moisture Resistance**—The heating pad with its outer cover fixed shall be placed in an approximately horizontal position with the edges turned up to form a shallow dish. Half litre of a one percent solution of sodium chloride shall be poured on it and retained for 10 minutes with the pad operating at full heat for the first 7 minutes and then switched off.

At the end of 10 minutes the solution shall be thrown away and the pad shall be placed between metal foils as in case of dielectric strength test with the modification that the area of the metal foil on both sides together shall not exceed 3000 cm<sup>2</sup>.

The leakage current shall be measured as described in 40 of IS:302-1967\*. The heating pad shall be deemed to be moisture resistant if the leakage current measured does not exceed 0.3 mA (peak value).

**12.12 Waterproofness**—The heating pad shall be completely immersed in a saline solution as defined in 12.11 above for a period of two hours, and shall not show a leakage current of more than 0.3 mA peak when 1.10 times the maximum rated voltage is applied between the current carrying parts and the saline solution.

In addition 1.10 times the maximum rated voltage shall be applied between the two cores of the supply flexible cord, with the thermostat contacts separated by mica strips or with the contacts opened by excess temperature. If a leakage current of more than 0.3 mA peak is recorded, the pad shall be deemed not to comply with this standard. In the case of multi-heat pad the test shall be repeated at each of the three settings of the control.

### 12.13 Endurance Test

**12.13.1 Thermal Operation**—The heating pad shall be placed between felt mats as described in the input test (see 12.8) and operated at the maximum rated voltage and input for 500 hours. At the end of this period the heating pad shall pass the tests described in 12.5, 12.6, 12.7 and 12.8.

**12.13.2 Inspection of Thermostats and Cut-Outs**—After operation for 500 hours as specified in 12.13.1 the heating pad shall be carefully opened out along two adjacent edges of the enclosure and any inner covering leaving the edges within 5 cm of the flexible cord entry unaffected. Any thermostats or thermal cut-out shall be carefully removed without disturbing the flexible cord anchorage. The thermostats and thermal cut-outs shall show no signs of electrical or mechanical failure pitting or fusion of contacts or failure of insulation. The thermostats and cut-outs shall then be tested for insulation resistance and ability to withstand high voltage between all current carrying parts and any metal enclosure used for them, as well as across the open contacts. The thermostats shall show an insulation resistance of at least 10 megohms and shall withstand 1000 V ac when tested according to 41.1 of IS:302-1967\*.

\*General and safety requirements for light electrical appliances (third revision).

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**12.14 Slow Burning Property**—The material shall be cut into a strip 50 mm wide and about 120 mm long. The strip shall be suspended vertically in a mild steel hollow cylinder 200 mm high and 100 mm in diameter with the top and bottom open. The cylinder shall be placed on an open tripod so that a Bunsen burner may be accommodated below it. The flame of a Bunsen burner shall be so adjusted that it is completely luminous and burns to a height of 40 mm. The flame shall be applied 20 mm below the lower end of the specimen under test for 15 seconds and withdrawn. The flame or afterglow of the specimen should not last beyond 2 seconds after withdrawal of the burner.



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**AMENDMENT NO. 1      OCTOBER 1975**  
**TO**  
**IS : 5161-1969 SPECIFICATION FOR FLEXIBLE**  
**ELECTRIC HEATING PADS FOR**  
**DOMESTIC USE**

This amendment is being issued to make reference to IS : 302-1973 'General and safety requirements for household and similar electrical appliances (fourth revision)' in place of IS : 302-1967 'General and safety requirements for light electrical appliances (third revision)'.

**Alterations**

(*Designation and title of IS : 302-1967*) — Substitute 'IS : 302-1973' for 'IS : 302-1967' and 'General and safety requirements for household and similar electrical appliances (fourth revision)' for 'General and safety requirements for light electrical appliances (third revision)' wherever they appear in the standard.

(*Page 4, clause 4.1*) — Substitute '7.11 and 7.12 of IS : 302-1973\*' for '5 of IS : 302-1967\*'.  
\*

(*Page 7, clause 9.3, last line*) — Substitute 'IS : 1416-1972†' for 'IS : 1416-1959†'.

[*Page 7, foot-note with double dagger (†) mark*] — Substitute the following for the existing foot-note:

†Specification for safety transformers (*first revision*).

(*Page 11, clause 12.6, line 8*) — Substitute '42.3 of IS : 302-1973\*' for '41.1 of IS : 302-1967\*'.  
\*

(*Page 11, clause 12.7, line 3*) — Substitute '42.3 of IS : 302-1973\*' for '41.1 of IS : 302-1967\*'.  
\*

(*Page 11, clause 12.8, last line*) — Substitute '45.1 of IS : 302-1973\*' for '43.1 of IS : 302-1967\*'.  
\*

(*Page 13, clause 12.11, para 3*) — Substitute '42.1 to 42.2 of IS : 302-1973\*' for '40 of IS : 302-1967\*'.  
\*

(*Page 13, clause 12.13.2, last line*) — Substitute '42.3 of IS : 302-1973\*' for '41.1 of IS : 302-1967\*'.  
\*

(ETDC 43)

AMENDMENT NO. 2    JUNE 1977  
TO  
IS:5161-1969 SPECIFICATION FOR FLEXIBLE  
ELECTRIC HEATING PADS FOR DOMESTIC USE

Alterations

*(Page 7, clause 9.1.1, last sentence)*  
Substitute the following for the existing sentence:

'The off position of the heating pads shall be indicated with tactile indicator for use in the dark.'

*(Page 10, clause 12.4) - Substitute the following for the existing clause:*

'12.4 Visual Examination and Inspection

12.4.1 The heating pads shall be visually examined and inspected for obvious visual defects in respect of components, parts and their assembly, construction, stability, marking, provision of suitable terminals for supply connections, earthing and the effectiveness of screws and connections.

12.4.2 The supply connections shall be of size appropriate to the rating (*see* 20 of IS:302-1973\*).

12.4.3 The external surface finish shall be even and free from finishing defects.'

(ETDC 43)

**AMENDMENT NO. 3     MAY 1978**  
**TO**  
**IS: 5161-1969 SPECIFICATION FOR FLEXIBLE**  
**ELECTRIC HEATING PADS FOR**  
**DOMESTIC USE**

**Addenda**

( *Page 5, clause 5.1.3* ) — Add the following new clause after 5.1.3:

**'5.1.4 Heating pads shall be Class II appliances.'**

( *Page 10, Table 1* )

a) *Sl No. 6* — Add the following new test after Sl No. 6 and re-number the subsequent items accordingly:

**'7 Leakage current                      42.1 and 42.2 of IS 302-1973\*'**

b) *Foot-note* — Add the following new foot-note at the end:

**'\*General and safety requirements for household and similar electrical appliances (fourth revision).'**

( ETDC 43 )

*Printed at Simco Printing Press, Delhi, India*

**AMENDMENT NO. 4 MAY 1989**  
**TO**  
**IS : 5161 - 1969 SPECIFICATION FOR**  
**FLEXIBLE ELECTRIC HEATING PADS FOR**  
**DOMESTIC USE**

( Page 13, clause 12.13.1 ) — Substitute the following for the existing clause

**'12.13.1 Thermal Operation** — The heating pad is placed between felt mats as described in the input test ( see 12.8 ) and operated such that the input is 1.15 times the rated input which shall be maintained throughout the test. The heating pad is operated for 96 operating hours under these conditions

At the end of this period, the heating pad shall pass the tests described in 12.5, 12.6, 12.7 and 12.8 '

( ETDC 43 )

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